

I claim:

1. A slide feeder for moving a slide from a first location to a second location, comprising:

5 a runway structure having a first end adapted to reach under said slide at said first location and a second end adapted to reach said second location;

10 a first plurality of nozzles associated with the runway structure and directing a first fluid flow along the runway structure in a first direction having an upward vertical component and a horizontal component away from said first end of the runway structure;

15 a second plurality of nozzles associated with the runway structure and directing a second fluid flow along the runway structure in a second direction having an upward vertical component and a horizontal component away from said second end of the runway structure; and

means for alternatively activating said first and second fluid flows.

20 2. The slide feeder of Claim 1, further comprising a first magazine with multiple, vertically stacked slots, each slot adapted to receive said slide, and wherein said first end of the runway structure is adapted to fit under the slide when the
25 slide is located in one of said slots.

3. The slide feeder of Claim 2, wherein said runway structure is mounted on a sample stage of an optical instrument, and said feeder includes a mechanism to move said second end of the runway structure to said second location for alignment with an objective of the instrument.

4. The slide feeder of Claim 1, wherein said first and second pluralities of nozzles are uniformly spaced apart along side edges of the runway structure.

5. The slide feeder of Claim 1, wherein said first and second directions of the fluid flows are at approximately 45 degrees from vertical.

6. The slide feeder of Claim 2, wherein said second location is a second magazine with multiple, vertically stacked slots, each slot adapted to receive said slide, and wherein said second end of the runway structure is adapted to fit under the slide when the slide is located in one of said slots of the second magazine.

7. The slide feeder of Claim 2, further comprising an elevator for vertical translation of the first magazine so that said slots can be aligned with the first end of the runway structure.

8. The slide feeder of Claim 3, further comprising a second magazine with multiple, vertically stacked slots, each slot adapted to receive said slide, and comprising a mechanism to replace said first magazine with said second magazine.

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9. The slide feeder of Claim 1, wherein said runway structure includes a first plenum providing fluid to said first plurality of nozzles and a second plenum providing fluid to said second plurality of nozzles.

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10. The slide feeder of Claim 9, wherein said first and second pluralities of nozzles are uniformly spaced apart along side edges of the runway structure and said first and second directions of the fluid flows are at approximately 45 degrees from vertical.

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11. The slide feeder of Claim 1, wherein said runway structure further comprises a third end adapted to reach a third location, a third plurality of nozzles associated with the runway structure and directing a third fluid flow along the runway structure in a third direction having an upward vertical component and a horizontal component away from said third end of the runway, and means for directing the slide toward one of said first, second and third directions.

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12. A method for moving a slide between a first location and a second location, comprising the following steps:

providing a runway structure having a first end adapted to reach under said slide at said first location and a second end adapted to reach said second location;

placing the first end of the runway structure under said slide when the slide is at said first location;

providing a first fluid flow along the runway structure in a first direction having an upward vertical component and a horizontal component away from said first end of the runway structure, thereby forming a first fluid bearing causing the slide to move to the second end of the runway structure; and

interrupting said first fluid flow to allow the slide to be landed at the second end of the runway structure.

13. The method of Claim 12, further including the steps of:

providing a second fluid flow along the runway structure in a second direction having an upward vertical component and a horizontal component away from said second end of the runway structure, thereby forming a second fluid bearing causing the slide to move to the first end of the runway structure; and

interrupting said second fluid flow to allow the slide to be landed at the first end of the runway structure.

14. The method of Claim 13, further including the steps of providing a first magazine with multiple, vertically stacked slots, each slot adapted to receive said slide; and providing an elevator for vertical translation of the first magazine so that each of said slots can be aligned with the first end of the runway structure; wherein said first end of the runway structure is adapted to fit under the slide when the slide is located in one of said slots.

15. The method of Claim 14, wherein said runway structure is mounted on a sample stage of an optical instrument, and the method further includes the step of providing a mechanism to move said second end of the runway structure to said second location for alignment with an objective of the instrument.

16. The method of Claim 13, wherein said first and second fluid flows are provided using pluralities of nozzles uniformly spaced apart along side edges of the runway structure.

17. The method of Claim 14, wherein said second location is a second magazine with multiple, vertically stacked slots, each slot adapted to receive said slide, and wherein said second end of the runway structure is adapted to fit under the slide when the slide is located in one of said slots of the second magazine.

18. The method of Claim 14, further comprising the steps of providing a second magazine with multiple, vertically stacked slots, each slot adapted to receive said slide, and providing a mechanism to replace said first magazine with said second magazine.

19. The method of Claim 12, further comprising the steps of providing a runway structure with a third end adapted to reach a third location, a third plurality of nozzles associated with the runway structure and directing a third fluid flow along the runway structure in a third direction having an upward vertical component and a horizontal component away from said third end of the runway, and means for directing the slide toward one of said first, second and third directions.

20. A slide feeder for moving a slide from a slot in a storage magazine to a stage of a microscope and back, comprising:

a magazine with multiple, vertically stacked slots, each slot adapted to receive a slide;

an elevator for vertical translation of the magazine so that said slots can be aligned with the slide feeder;

a runway structure having a first end adapted to reach under said slide in the slot of the magazine and a second end including a window for processing the slide in the stage of the microscope;

a carriage for moving the runway structure from a distal position wherein said first end thereof is placed under the slide to a proximal position wherein the window can be aligned with an objective of the microscope;

5 a first plurality of nozzles associated with the runway structure and directing a first air flow along the runway structure in a first direction having an upward vertical component and a horizontal component away from said first end of the runway structure;

10 a second plurality of nozzles associated with the runway structure and directing a second air flow along the runway structure in a second direction having an upward vertical component and a horizontal component away from said second end of the runway structure; and

15 means for alternatively activating said first and second air flows.

21. The slide feeder of Claim 20, wherein said first and second pluralities of nozzles are uniformly spaced apart along side
20 edges of the runway structure.

22. In a microscope system for processing a plurality of slides automatically, wherein a slide feeder is provided to sequentially retrieve a slide and transport it to a stage of a microscope and back, the improvement comprising a magazine with multiple, vertically stacked slots, each slot being adapted to accommodate one of said slides and to receive said slide feeder for engagement and retrieval of the slide, and an elevator to align the slots in the magazine with the slide feeder.